



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,358	01/19/2006	Orestes J. Varonis	TIMK 8394W1	5581

1688 7590 03/09/2007
POLSTER, LIEDER, WOODRUFF & LUCCHESI
12412 POWERSCOURT DRIVE SUITE 200
ST. LOUIS, MO 63131-3615

EXAMINER

DAVIS, OCTAVIA L

ART UNIT	PAPER NUMBER
----------	--------------

2855

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/517,358

Applicant(s)

VARONIS, ORESTES J.

Examiner

Octavia Davis

Art Unit

2855

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 11/29/04.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Objections

1. Claims 12 and 23 are objected to because of the following informalities: In claim 12, line 5, "wherein the second excitation coil and the second sensing coil" is vague and indefinite. In claim 23, line 1, "the excitation coil and sensing coil" lack antecedent basis. Appropriate corrections are required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 – 8, 20 – 26 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Seegers (5,018,393).

Regarding claims 1 and 20, Seegers discloses a device for determining torque transmitted in a shaft comprising a shaft 1, a bearing 3 attached to shaft and including an inner race (See Fig. 2), an outer race 4 and rolling elements 5, a magnetelastic ring 15 press-fit onto the inner race, coils 7, 13, 14 placed in close proximity to the ring and an electrical circuit (See Col. 3, lines 37 – 40).

Regarding claims 2, 3, 21 and 22, the inner race is tapered (See Fig. 2) and the ring 15 is press fit to the inner race upon a journal 16.

Regarding claims 4 – 8 and 23 – 26, the coils 13, 14 are packaged in a single unit 15, 16 and include a seal 11, 12 of which is mounted in an outer race 19 (See Fig. 2).

Regarding claim 28, the sensors 10 are hall emitters of which are magnetic sensors.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 9 – 16, 19 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seegers (393') in view of Jacobson (2,438,288).

Regarding claim 11, Seegers discloses all of the limitations of this claim except that the electrical circuit comprises a bridge balancing circuit that receives an output of the sensing coil, an amplifier for amplifying the output of the bridge balancing circuit a demodulator for demodulating the output of the amplifier; and a filter that filters the output of the demodulator to generate a sensor. However, Jacobson discloses an apparatus for determining balance in an electrical network comprising a bridge balancing circuit 26 that receives an output of a coil (See Col. 6, lines 58 – 63 and Col. 9, lines 53 – 66), an amplifier 12 (See Col. 5, lines 27 – 37), a demodulator 14 that demodulates the output of the amplifier 12 (See Col. 6, lines 39 – 46) and a filter 63 that filters the output of the demodulator (See Col. 5, lines 44 – 52).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seegers according to the teachings of Jacobson for the purpose of,

Art Unit: 2855

providing an electrical bridge system in which unbalance potentials developed in the bridge network may readily be amplified for the purpose of detection or of operating a rebalancing motor in a direction corresponding to those unbalanced conditions (See Jacobson, Col. 2, lines 8 – 14).

Regarding claims 9, 10, 12, 13, 19 and 27, in Seegers, a second excitation coil 13 and a second sensing coil 14 are provided having equal amplitude and opposite phase and it would have been obvious to provide additional coils to determine the torque transmitted in a shaft (Duplicating the components of a prior art device is a design consideration within the skill of the art. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

Regarding claim 14, in Seegers, the ring 15 is divided into two parts of which the coils are attached.

Regarding claim 15, in Seegers, the coils are spaced apart at 180 degrees (See Fig. 2).

Regarding claim 16, in Seegers, the coils are incorporated in the bearing rims 16 (See Fig. 2).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 17, 18 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seegers in view of Jacobson, as applied to claims 1 - 16 and 19 – 29 above, and further in view of Garshelis (5,052,232).

Regarding claims 17, 18 and 29, Seegers and Jacobson disclose all of the limitations of these claims except for teachings that the magnetoelastic ring has knurled grooves over its outside diameter, wherein the knurled grooves nearest the first excitation and sensing coils are disposed at +45 degrees from the axis defined by the center axis of the shaft and the knurled grooves nearest the second excitation and sensing coils are disposed at -45 degrees from the axis defined by the center axis of the shaft, such that the knurled grooves are parallel to the lines of tension and compression of the magnetoelastic ring. However, Garshelis discloses a magnetoelastic torque transducer comprising a magnetostrictive sensor including magnetoelastic rings 6,8 connected to a pair of excitation coils 22, 26 and sensing coils 20, 24, wherein when a torque is applied to a shaft 2, the rings are subjected to tensile and compressive stresses (See Col. 19, lines 5 – 13 and Col. 13, lines 14 – 34).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Seegers and Jacobson according to the teachings of Garshelis for the purpose of, advantageously inducing residual stress in a shaft of virtually any diameter and closely controlling the exact locations of the bands, their axial extent, separation and location (See Garshelis, Col. 13, lines 14 – 15).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Garshelis (6,553,847) discloses a collarless circularly magnetized torque transducer and method for measuring torque using the same.

Wan et al (7,143,656) disclose a reduced axial movement error in a torque sensing system.

Garshelis (6,490,934) discloses a circularly magnetized non-contact torque sensor and method for measuring torque using the same.

Garshelis (4,882,936) discloses a magnetoelastic torque tool.

Hesthamar et al (5,386,733) discloses a sensor and method for measuring torque and/or axial stresses.

Hendershot, Jr. et al (3,664,473) disclose a combination magnetic particle clutch and brake assembly.

Naidu et al (6,871,553) disclose an integrating fluxgate for magnetostrictive torque sensors.

May et al (6,581,480) disclose magnetizing arrangements for a torque and force sensor.

May (6,997,065) discloses a torque measurement apparatus.

Dombrowski (6,341,534) discloses an integrated two-channel torque sensor.

Swisher et al (5,817,952) disclose an opposing taper fit collar for attaching a torque sensing transducer to a rotatable shaft.

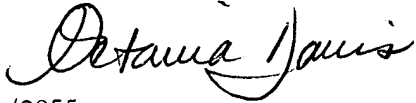
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Octavia Davis whose telephone number is 571-272-2176. The examiner can normally be reached on Mon through Thurs from 9 to 5. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz, can be reached on ***. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished


Art Unit: 2855

applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



OD/2855

3/1/07



EDWARD LEFKOWITZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800